

REMARKS/ARGUMENTS

Claims 1-37 are resubmitted. Claims 1, 11, 19, 24, 25, and 31 are currently amended. No new claims have been added. No claims have been canceled.

Claims 1, 3, 10, 11, 13, 15, 18, 19, 23, 25-28, 30-33, and 35 have been rejected under 35 USC 102(a) as being anticipated by PCT WO 03035380. Claims 1-37 have been rejected under 35 USC 103(a) as being unpatentable over PCT WO 03035380 in view of Koury (US 6,073,670) and either one of Bendarzewski et al. (US 4,946,538) or Zsolnay et al. (US 5,213,646) further taken with the admitted prior art and EP 198,744 optionally further take with Emert.

Examiner Interview

A telephone interview was conducted between the Examiner and Applicant's representative on May 18, 2006. A proposed amendment to the claims was discussed along with the references including PCT WO 03035380 and Koury (US 6,073,670). No agreement was reached.

PCT WO 03/035380

Claims 1, 11, 19, 24, 25, and 31 have been amended. Support for the amendments can be found in the specification as filed, for example, at paragraphs [0029], [0030], [0041], and [0046].

Neither PCT WO 03035380 nor any of the references cited address the problem of obtaining practical productivity for the composite laminate lay up of

extremely large structures, e.g., those with mandrel diameter exceeding 15 feet. For example, while it might normally be considered obvious to increase productivity by merely increasing the number of material delivery heads used simultaneously, such a straightforward approach works only up to a certain size of tool or mandrel beyond which the approach breaks down and no longer provides productivity increases.

For example, each material delivery head is subject to a certain amount of down time, e.g., for maintenance and cleaning, that generally occurs at random. As a problem with each head has the effect of stopping all the heads, it may be expected that down time for multiple heads increases with the number of heads. Thus, the machine utilization factor, i.e., the complement of “down time” or the amount of “up time”, for a device with multiple heads may be expected to decrease as the number of heads is increased even though the utilization factor for each individual head remains the same. For example, by increasing the number of material delivery heads beyond a certain number, it is conceivable that productivity is actually decreased, or fails altogether, as the machine begins to spend excessive amount of time being broken down.

At the time the invention was made, those of ordinary skill in the art held an expectation that rates sufficient for composite lay up of mandrels larger than 15 feet in diameter could not be achieved because material delivery rate increases beyond those obtained in proportion to increasing the number of heads were needed, and due to, among other things, the expected machine utilization factor phenomenon described above, even a linear increase in material delivery rate with the number of heads was thought not to be achievable. Thus, Applicants respectfully submit that the features claimed by the present invention, in particular:

1. increased delivery of composite material disproportionate to the

- number of material delivery heads over that of a single material delivery head as in amended claims 1, 19;
2. the device lays down at least 700 pounds per hour (lbs/hr) of composite material as in amended claims 11, 19, 24, and 25;
 3. the device covers a mandrel having a diameter of least 15 feet as in amended claim 25;
 4. increased machine utilization factor of the device disproportionate to the number of material delivery heads compared to a single head as in amended claim 11,
 5. each head operates at a speed, material width, and material weight that increases a utilization factor of each head so that the device operates at a machine utilization factor that increases composite material delivery rate of the device disproportionately as in amended claim 24;
 6. the material delivery heads operate at a speed, material width, and material weight so that the device operates at a machine utilization factor that increases rate of delivery of composite material disproportionately as in amended claim 25; and
 7. operating each material delivery head at a utilization factor so that the device operates at a machine utilization factor that increases rate of delivery of composite material disproportionately beyond the increase of the number of material delivery heads over a single material delivery head as in amended claim 31

should be considered surprising, i.e., an unexpected result, and, thus, neither anticipated nor made obvious by any of the prior art cited, whether or not combined.

CONCLUSION

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Amdt. dated June 27, 2006
Reply to Office Action of April 4, 2006

Applicants would like to thank the Examiner for the telephone interview of May 18, 2006. Reconsideration and withdrawal of the Office Action with respect to claims 1-37 are requested. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

In the event the examiner wishes to discuss any aspect of this response, please contact the attorney at the telephone number identified below.

☒ The Commissioner is hereby authorized to charge payment of the following fees with this communication or credit any overpayment to Deposit Account No. 50-0851:

☒ Any filing fees under 37 CFR 1.16 for the presentation of extra claims.

Respectfully submitted,

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